LISBON SCHOOL OF ECONOMICS & MANAGEMENT
UNIVERSIDADE DE LISBOA

Finance and Financial Reporting

Master in Actuarial Science

Exam EN

11/01/2017

3 HOURS

No.

Name: ______________________________ ____________

PLEASE READ THE FOLLOWING INFORMATION BEFORE SOLVING THE EXAM:

1) You are allowed to keep your pens, pencils and a calculator with you as well as the current edition of the Formulae and Tables. The calculator cannot have neither communications nor any kind of texting features.
2) The structure of the exam is the following:
    - Questions 1 to 10 are multiple choice;
    - Questions 11 to 20 require explaining all the steps in your solutions.
3) You must not start writing your answers in the booklet until instructed to do so by the supervisor.
4) Mark allocations are shown in brackets.
5) Attempt all 20 questions. Answer questions 1-10 in the grid to answer multiple choice questions. Answer questions 11-20 in the space given below the question. If you eventually require more space, please, use the additional sheet at the end of this booklet.
6) Candidates should show calculations where this is appropriate.
7) **You are not allowed to un-staple the exam. However, you can detach the scrap paper.**

GOOD LUCK!

GRID TO ANSWER MULTIPLE CHOICE QUESTIONS

Question #	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

1) [2 points] The Principal-Agent Problem arises:

a) Because managers have little incentive to work in the interest of shareholders when this means working against their own self-interest
b) Because of the separation of ownership and control in a corporation
c) Both A and B
d) None of the above

2) [2 points] Which of the following is a common rationalization for fraudulent financial reporting?

a) This is a one-time transaction and it will allow the company to get through the current financial crisis, but we'll never do it again.
b) We are only borrowing the money; we will pay it back next year.
c) Executives at other companies are getting paid more than we are, so we deserve the money.
d) The accounting rules make sense for our company, and they make our financial results look weaker than is necessary, so we have a good reason to record revenue using a nonGAAP method.

3) [2 points] In what regards payout policy, which of the following statements is FALSE?

a) In perfect capital markets, holding fixed the investment policy of a firm, the firm's choice of dividend policy is irrelevant and does not affect the initial share price.
b) In a perfect capital market, when a dividend is paid, the share price drops by the amount of the dividend when the stock begins to trade ex-dividend.
c) In perfect capital markets, an open market share repurchase has no effect on the stock price, and the stock price is the same as the ex-dividend price if a dividend were paid instead.
d) In perfect capital markets, investors are indifferent between the firm distributing funds via dividends or share repurchases. By reinvesting dividends or selling shares, they can replicate either payout method on their own.

4) [2 points] Posora Energy issued \$100 million in perpetual debt (at par) with an annual coupon of 7%. Posora will pay interest only on this debt. Posora's marginal tax rate is expected to be 40% for the foreseeable future. The present value of Posora's annual interest tax shield is now closest to:

a) 70
b) 40
c) 3
d) 23

[Solution]

$$PV\left(ITS\right)=D\times\tau_c=100\times0.4=40$$

5) [2 points] Investors who purchased shares from the Clarabook IPO did so in which market?

a) primary market

b) secondary market
c) over-the-counter market
d) NYSE

6) [2 points] What is the relative tax advantage of debt? Assume that personal and corporate taxes are given by: TC = (corporate tax rate) = 35%; TpE = personal tax rate on equity income = 30%; and Tp = personal tax rate on interest income = 20%.

a) 1.76
b) 1.16
c) 1.35
d) 0.86

[Solution]

Relative advantage = (1 - 0.2)/[(1 - 0.3)(1 - 0.35)] = 1.76.

Use the following data for the next two questions:

Income Statement (€m)		**Balance Sheet (€m)**			
Revenue	54 000	Non-Current Assets	26 000	Equity	73 000
Cost os Sales	34 800	Current Assets	105 000	Non-Current Liabilities	38 000
EBIt	19 200			Current Liabilities	20 000
Taxes	5 376	Total	131 000		131 000
Profit for the year	13 824				

7) [2 points] The Current Ratio is closest to:

a) 1.00
b) 0.19
c) 5.25
d) 0.68

[Solution]

$$CR = \frac{105.000}{20.000} = 5.25$$

8) [2 points] The Return on Equity is closest to:

a) 0.74
b) 0.11
c) 0.15
d) 0.19

[Solution]

$$ROE = \frac{13.824}{73.000} = 0,1894$$

9) [2 points] Concerning the IRR, Which of the following statements is FALSE?

a) The IRR investment rule states you should turn down any investment opportunity where the IRR is less than the opportunity cost of capital.

b) The IRR investment rule states that you should take any investment opportunity where the IRR exceeds the opportunity cost of capital.

c) Since the IRR rule is based upon the rate at which the NPV equals zero, like the NPV decision rule, the IRR decision rule will always identify the correct investment decisions.

d) There are situations in which multiple IRRs exist.

10) [2 points] An analyst has collected the following information regarding a company in advance of its year-end earnings announcement (in millions):

Estimated net income: €200
Beginning retained earnings: €1,400
Estimated distributions to owners: $100

What is the analyst's estimate of ending retained earnings (in millions)?

a) 1500
b) 1600
c) 1700
d) 1300

[Solution]

$$\textit{Estimated Retaining Earnings} = 1{,}400 + 200 - 100 = 1{,}500$$

11) [5 points] Briefly explain the difference between beta as a measure of risk and variance as a measure of risk.

[Solution]

Variance measures the total risk of a security and is a measure of stand-alone risk. Total risk has both unique risk and market risk. In a well-diversified portfolio, unique risks tend to cancel each other out and only market risk remains. Beta is a measure of market risk and is useful in the context of a well-diversified portfolio. Beta measures the sensitivity of the security returns to changes in market returns. The market portfolio has a beta of one and thus has average risk.

12) [5 points] Briefly explain the role of underwriters in the issuance of securities.

[Solution]

The underwriters are an integral part of the securities market. Underwriters have the expertise and contacts necessary to design and distribute the securities. Underwriters provide advice and guidance in the preparation of the security issue, and price it and sell it to investors.

13) [5 points] Briefly explain how shareholders' returns are taxed twice.

[Solution]

Shareholders' returns are taxed at the corporate level as corporate tax. Distributions of the remaining earnings are taxed a second time at the shareholders' level as either tax on dividends tax or as capital gains tax.

14) [5 points] Briefly explain the term agency costs as related to a corporation

[Solution]

Agency costs arise in a corporation as a result of principal-agent problems. For example, managers may not act in the best interests of shareholders while making decisions. Hence, shareholders incur monitoring costs that are called agency costs. It also arises as a result of informational asymmetry between managers and other stakeholders of a firm. Agency costs tend to reduce the value of a firm.

15) [5 points] State and explain the generalized version of Modigliani-Miller Proposition I.

[Solution]

Modigliani-Miller Proposition I states that changes in capital structure do not affect the value of a firm. MM's Proposition I is an extremely general result. Any change in the capital structure of the firm can be duplicated or "undone" by investors at no cost. Investors need not pay extra for borrowing indirectly (by holding shares in a levered firm) when they can borrow just as easily and cheaply on their own account. It applies equally to trade-offs of any choice of financial instruments. For example, the choice between long-term debt and short-term debt would also not affect the value of the firm. Generally, the choice between issuing preferred stock, common stock, or some combination of the two should not have any effect on the overall value of the firm. It also applies to the mix of debt securities issued by the firm. The choices of long-term versus short-term, secured versus unsecured, senior versus subordinated, and convertible and nonconvertible debt all should not have any effect on the overall value of the firm.

16) [5 points] Explain the pecking order theory of capital structure.

[Solution]

This theory is based on the observation that, in general, managers know more about the firm's prospects, risks, and values than do outsiders. Their asymmetric information affects managers' choices between internal and external financing and between new issues of debt and equity. The key problem is the difficulty of selling securities to investors at a fair value. Investors infer—by the mere act of selling stock—that the stock must be overvalued. The implication is that firms prefer internal financing to external financing. When firms are propelled to go for external financing, they prefer debt to equity.

17) [5 points] In what concerns Futures, explain what is meant by a perfect hedge. Does a perfect hedge always lead to a better outcome than an imperfect hedge? Explain your answer.

[Solution]

A perfect hedge is one that completely eliminates the hedger’s risk. A perfect hedge does not always lead to a better outcome than an imperfect hedge. It just leads to a more certain outcome.

Consider a company that hedges its exposure to the price of an asset. Suppose the asset’s price movements prove to be favorable to the company. A perfect hedge totally neutralizes the company's gain from these favorable price movements. An imperfect hedge, which only partially neutralizes the gains, might well give a better outcome.

18) [10 points] Suppose you are given the following information about the yields to maturity of three risk-free zero coupon bonds with maturities 1, 2 and 3 years.

Year t	**1**	**2**	**3**
YTM	2.8%	3.1%	3.4%

i) [4 points] Is this yield curve economically healthy? Explain.

[Solution]

Yes, the yield curve is economically healthy, since it is upwards slopping. Such a curve is healthy because implies that expected yields will increase as a consequence of sound GDP's growth.

ii) [6 points] Consider now two coupon bonds. Both have three years to maturity, but the first one has a YTM of 3.4% and the second one a YTM of 4%. Which one has the lowest duration? Explain.

[Solution]

Since the second coupon bond has a higher YTM, its duration is lower when compared with the first bond. This happens because the cash flows closer to maturity will be more heavily discounted, decreasing more significantly its weight on the bond's duration.

19) [20 points] Consider a new 3-year project – Project ARALC – for production of a new beer by the well-known brewers Pilsener (who are very experienced in this line of business) with the following expected revenues:

Year	**1**	**2**	**3**
Revenues	200	150	80

In this industry, the costs of sales (excluding depreciation) are approximately 40% of the revenues. Capital expenditures today are 120, in a machine with a life of 3 years (straight-line depreciation, fully depreciated in 3 years). The net working capital is expected to be close to 10% of the next year annual revenues. In the table below, you can find the estimated free cash flows.

t	0	1	2	3	4
Revenues	0	200	150	80	
Costs Excluding Depreciation	0	80	60	32	
Depreciation	0	40	40	40	
EBIT	0	80	50	8	
EBIT(1-Tc)	0	52	32,5	5,2	
CapEx	120	0	0	0	
Depreciation	0	40	40	40	
NWC	20	15	8	0	
Change NWC	20	-5	-7	-8	0
FCF	-140	97	79,5	53,2	0

The project is going to keep the current firms' capital structure. The risk of this project is similar to the firm's average risk. The company will pay taxes at a rate of 35%. We have also collected the following financial information about the company:

Pilsener Brewers Market Value Balance Sheet and Cost of Capital

Assets		**Liabilities**			
Cash	100	Debt	200	Cost of Debt	5%
Other Assets	1000	Equity	900	Beta Equity	1,5

The risk-free interest rate is 3% and the expected market return is 9%.

a) [10 points] Calculate the after tax cost of capital. Explain.

[Solution]

$$R_e = 0.03 + 1.5(0.09 - 0.03) = 0.12$$
$$E = 900$$
$$D\,(net\ debt) = 200 - 100 = 100$$
$$E + D = 1000$$
$$WACC = 0.12\frac{900}{1000} + 0.05(1 - 0.35)\frac{100}{1000} = 0.1113$$

b) [10 points] Should Pilsener invest in the project? Explain. **[Solution]**

$$NPV = -140 + \frac{97}{1.1113} + \frac{79.5}{1.1113^2} + \frac{53.2}{1.1113^3} = 50.44$$

Yes, Pilsener should invest since NPV>0.

20) [15 points] A well know global corporation called CLA.POSO, plc. is preparing the year-end financial statements. For this end, your help is required. So, use the following data to prepare:

a) Statement of Profit or Loss (income statement) [10 points]

b) Statement of Financial Position (balance sheet) [5 points]

Year-end Trial Balance

	Debit	Credit
Administrative staff salaries	4 020	
Cash	28 370	
Short-term financial Investment	25 500	
Production staff wages	16 305	
Dividend paid	22 500	
External consulting fee	5 430	
Loan Interest	6 000	
Long term loan		67 500
Manufacturing overheads	10 305	
Opening inventory	6 960	
Plant and Equipment - cost	135 615	
Plant and Equipment - depreciation		72 795
Directors' salaries	6 300	
Property - Cost	147 000	
Property - depreciation		21 840
Purchases	143 750	
Retained Earnings		31 770
Revenue		321 700
Sales staff commission	7 800	
Sales staff salaries	17 775	
Share capital		112 500
Trade Payables		24 050
Trade receivables	68 525	
	652 155	**652 155**

Values in €000

Additional information (€000)

- Closing inventory: €10 655
- Sales staff commission of €1 080 will be paid only in the new coming year
- Depreciation for the current year has still to be recorded on the following basis:
  - Property: 2% straight line
  - Plant and equipment: 25% straight line
- Director's bonus of €2 000 are recorded in the current year but will be paid only in the new coming year and totals
- The corporate tax rate is 20%

[Solution]

CLA.POSO, plc.
Statement of Profit of Loss

Revenue	321 700
Cost of Sales	203 509
Gross Profit	*118 191*
Selling and distribution	26 655
Administrative expenses	17 750
Operating Profit/EBIT	*73 786*
Finance Charge	6 000
Profit before tax	*67 786*
Tax expense	13 557
Profit for the year	54 229

Cost of Sales	**203.509**
Direct Material	140.055
Direct Labor	16.305
Depreciation	36844
Manufacturing Overheads	10.305

CLA.POSO, plc.
Statement of Financial Position

Non-current Assets	151 136
Current Assets	
Inventory	10 655
Trade receivables	68 525
Cash and Equivalents	53 870
	133 050
Total Assets	**284 186**
Equity	
Share capital	112 500
Retained Earnings	63 499
	175 999
Non-current liabilities	
Loan	67 500
Current Liabilities	
Trade payables	24 050
Accruals	3 080
Tax	13 557
	40 687
Total Liabilities	**108 187**
Total Equity+Liabilities	**284 186**

ADDITIONAL SPACE TO ANSWER

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SCRAP PAPER

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